

Catalogue of American Amphibians and Reptiles.

WASSERMAN, AARON O. 1970. *Scaphiopus couchii*.*Scaphiopus couchii* Baird
Couch's spadefoot toad

Scaphiopus couchii Baird, 1854:62. Type-locality, "Coahuila and Tamaulipas," restricted to "Matamoros, Tamaulipas," Mexico by Smith and Taylor (1950:345). Probable syntypes, U. S. Natl. Mus. 3713, 3714 and 3715 collected by D. N. Couch in 1853; reported lost or destroyed (Kellogg, 1932:20). Presumably, USNM 3715 was utilized by Baird, although direct evidence is lacking.

Scaphiopus varius Cope, 1863:52. Type-locality, "Cape St. Lucas, Lower California", Mexico. Syntypes, USNM 5893 (3 specimens, seen by author).

Scaphiopus rectifrenis Cope, 1863:53. Type-locality, "Tamaulipas, Coahuila", Mexico. Baird's syntypes of *S. couchii*, USNM 3714 and 3715 transferred by Cope to *S. rectifrenis* (Kellogg, 1932:20).

Scaphiopus couchii varius: Cope, 1866:313. First use of this combination.

Scaphiopus varius varius: Cope, 1875:31. First use of this combination.

Scaphiopus varius rectifrenis: Cope, 1875:32. First use of this combination.

Scaphiopus couchi: Yarrow, 1883:177. Emendation of ending. *Spea laticeps* Cope, 1893:155. Type-locality, "between Seymour, in northwest Texas south of the Red River, and Austin." Holotype, Acad. Nat. Sci. Philadelphia 13610 (not seen by author).

Scaphiopus couchi rectifrenis: Smith and Sanders, 1952:209. First use of this combination.

• CONTENT. No subspecies are recognized, but see Nomenclatural History.

• DEFINITION. Adult males of this stout-bodied species attain a snout-vent length of 70 mm, and females may reach 82 mm. Pectoral glands are lacking; tympana and the circular parotoid glands are indistinct. The species is characterized as follows: the internarial distance is less than interorbital distance; the dark edge of the metatarsal tubercle is only twice as long (or less) as broad; the skin of the dorsum is uniformly tuberculate; the skull has dermal encrustation and a frontoparietal region which is narrow in front and much wider posteriorly, with the greatest width reached about three-quarters of the way back, in contrast to the narrower frontoparietal without lateral expansions of *S. holbrookii hurterii*. Adult *S. couchii* are readily distinguished externally from the

sympatric *S. holbrookii hurterii* by the interorbital boss and the pattern of lyre-shaped light bands on the dorsum of the latter, and the absence of these characters in *S. couchii*. Individuals of *S. couchii* are distinguished from those of the subgenus *Spea* by the frontoparietal fontanelle and the cuneiform-shaped metatarsal tubercle of the latter, and the lack of the fontanelle and a sickle-shaped tubercle in *S. couchii*.

• DESCRIPTIONS. See Conant (1958), Dickerson (1906), Kellogg (1932), Stebbins (1951 and 1966), Strecker (1908c), Tanner (1939), A. P. Blair (1957), Taylor (1952), and Wright and Wright (1949) for descriptions of adult color, pattern and structure. Livezey and Wright (1947) described eggs; Wright (1929) and Bragg (1944-1945 and 1957a) described tadpoles.

Scaphiopus couchii has a highly variable pattern which may be reticulated (green with black markings), mottled (black, green and yellow or brown), or solid green with black flecks. The pattern of mature males is often obscured by a suffusion of bright green. The male breeding call has been likened to the bleat of a lamb or a drawn out "yeow". For a phonograph recording and description of the call refer to Bogert (1958a and 1958b, respectively). Tadpoles are small (between 18 and 24 mm), black, with an even peppering of iridophores on the body and tail musculature. The labial tooth formula is usually 4/4, rarely 3/4, 5/4, 5/5 or 2/4.

• ILLUSTRATIONS. See Bogert (1960) for a photograph of a clasping pair, and Ortenburger (1924) for one of a calling male. For illustrations in color, see Stebbins (1966), Dickerson (1906), and Cochran (1961). Other photographs in black-and-white were published by Bragg (1965), Conant (1958), Dickerson (1906), Taylor (1936), Tinkham (1962), and Wright and Wright (1949). See Noble (1924) for a drawing of the vertebral column, Cope (1889, pl. 68) for the sternum, and Tanner (1939), Zweifel (1956), and Wasserman (1957b) for skull illustrations.

• DISTRIBUTION. *Scaphiopus couchii* ranges from southwestern Oklahoma westward through Texas, southern New Mexico, and southern Arizona to southeastern California, and southward in Mexico to San Luis Potosí, Nayarit and the southern tip of Baja California. In Texas and Oklahoma it is typically a short grass plains form; in more xeric regions it

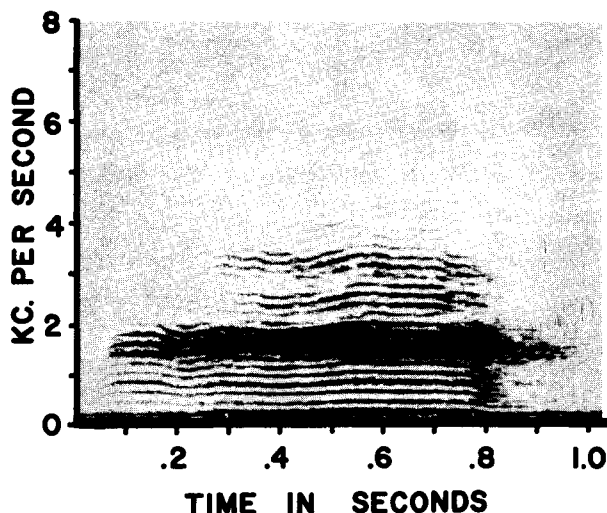
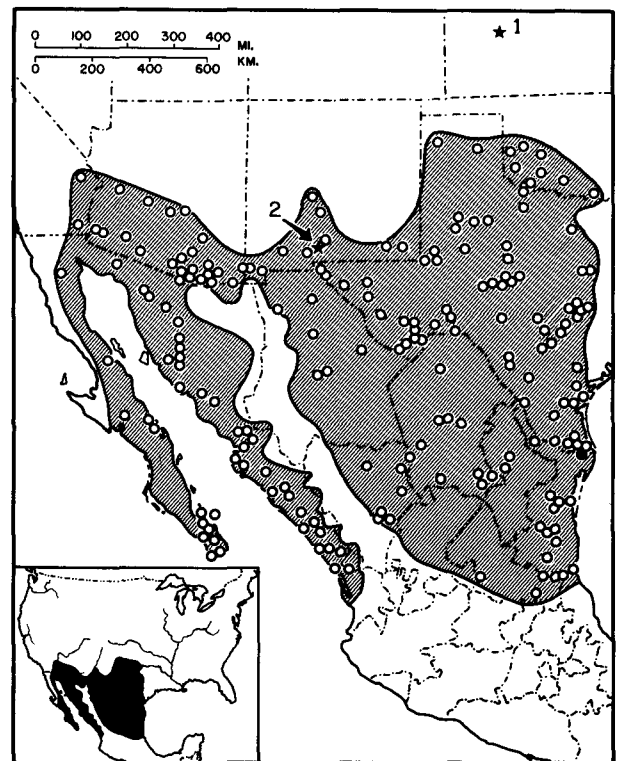


FIGURE. Audiospectrogram (narrow band, 45 cycles per second) of mating call of *Scaphiopus couchii*: Hidalgo County, New Mexico, 22 July 1955 (Amer. Mus. Nat. Hist. Dept. Herpetology tape library).



MAP. The solid circle marks the type-locality; open circles indicate other records. Stars indicate fossil records.

may be found in a wide variety of desert and grassland habitats (Lowe, 1964). United States locality records are summarized in a map by Zweifel (1956). Individual records are in the following: Arizona—Bogert (1960), Gates (1957), King (1932), and Stebbins (1951); California—Mayhew (1962; 1965) and Tinkham (1962); New Mexico—Gehlbach (1956, 1959), Lowe (1954), McAlister ("1958" [1959]), and Stroud (1949); Oklahoma—Bragg (1941, 1950, 1964); Texas—Axtell ("1958" [1959] 1959), Axtell and Wasserman (1953), W. F. Blair (1955), Boulenger (1886), Brown (1950), Hubbs and Armstrong (1961), Minton ("1958" [1959]), Olson (1959), Smith and Sanders (1952), and Wasserman (1957a, 1957b, 1963, 1964).

Locality records for several states in Mexico are given by Davis and Dixon (1957), Smith and Taylor (1948), and Taylor and Smith (1945). References to localities in particular states follow: Baja California—Belding (1887), Etheridge (1961), Leviton and Banta (1964), Linsdale (1932), Savage (1960), Slevin (1928), Soule and Sloan (1966), Van Denburgh (1895) and Van Denburgh and Slevin (1921); Chihuahua—Chrapliwy, Williams and Smith (1961), Firschein (1950), Fugler and Webb (1956), Smith, Williams and Moll (1963); Coahuila—A. P. Blair (1947a), Garman (1887), and Schmidt and Owens (1944); Durango—Sanders (1938); Nayarit—Kellogg (1932); Nuevo Leon—Maldonado-Koerdell (1949); San Luis Potosi—Dunn (1936), Garman (1887), and Taylor (1952; 1953); Sinaloa—Hardy and McDiarmid (1969), Taylor (1936); Sonora—Allen (1933), Bogert and Oliver (1945), Burger and Hensley (1949), Croulet ("1963" [1964]), Davis and Dixon (1957), Langebartel and Smith (1954), and Zweifel and Norris (1955); Tamaulipas—Martin (1958), P. W. Smith and Darling (1952).

• **FOSSIL RECORD.** Wilson (1968) identified several bones from two localities in Trego County, Kansas (1 on map), as probably of this species, although he does not exclude the possibility that the fossils represent an intermediate form or a variation of *S. holbrookii*. The deposits are assigned to the Middle or Late Clarendonian of the Lower Pliocene. Brattstrom (1964) identified *S. cf. couchii* in post-Wisconsin cave deposits in the Organ Mountains, south-central New Mexico (2 on map).

• **PERTINENT LITERATURE.** In similar studies, Ballinger and McKinney (1966), Hubbs and Armstrong (1961), Hubbs et al. (1963) and Zweifel (1968) agreed that the lower limiting temperatures for early *couchii* embryos is 15° C. Zweifel (1968) established the upper limiting temperature for early *couchii* embryos as approximately 34° C, and presented comprehensive data for developmental rates at a number of different temperatures. Brattstrom (1963) recorded body temperatures of adults collected at night on desert roads.

McClanahan (1967) discussed adaptations of *couchii* adults to desert environments. McClanahan (1964) showed that *couchii* muscles have a higher tolerance to hypertonic concentrations of sucrose and urea than those of other anurans tested. Elkan (1968) suggested that mucopolysaccharides in *couchii* skin retard water loss. Mayhew (1965) suggested that two populations of *couchii* discovered in the Colorado Desert of California are relict, surviving due to special environmental conditions in these localities.

Wasserman (1957a, 1957b, 1963, 1964) and A. P. Blair (1947a) reported results of experimental and natural hybridizations between *couchii* and other spadefoot species. Bragg and Hayes (1963), Morescalchi (1968), Savage (1960) and Zweifel (1956) discussed aspects of evolution of *couchii*.

The following authors discussed breeding behavior of this species: Lowe (1954), Bragg (1945), A. P. Blair (1947a, 1947b), Awbrey (1968), McAlister ("1958" [1959]), Jameson (1955), King (1932) and Wasserman (1957b). W. F. Blair (1955) and Bogert (1958b) presented sonagrams of the *couchii* mating call. McAlister (1959) compared vocal structure and mating call of *couchii* with those of other members of the subgenus *Scaphiopus*.

Elias and Shapiro (1958) described histological preparations of *couchii* skin; Szarski and Czopek (1965) presented data on the mean volume of *couchii* liver cells. Holman (1963) found no fusions between the sacrum and presacral vertebrae in *couchii*, although such fusions were found in *S. h. holbrookii*. Tihen (1960) discussed webbing in sacral diapophyses of *couchii*. Czopek (1965) and Czopek, Rys and Szemro (1968) presented information on capillary distribution in respiratory surfaces. Hutchison, Whitford and Kohl (1968) related body size and surface area to gas exchange. Wasserman and Bogart (1968) described the karyotype of *couchii*.

Licht (1967) studied the inhibitory effects of crowding, and of water taken from containers crowded with *Rana pipiens* tadpoles, on *couchii* tadpole growth.

Stroud (1949) found that a white *couchii* from the White Sands National Monument darkened in the laboratory, indicating that it is not a genetic variant.

For studies of various facets of ecology and natural history of *couchii*, see the following: Bogert and Oliver (1945), Bragg (1944-1945, 1950, 1957b, 1961, 1962, 1964, 1965), Bragg and Hayes (1963), Bragg and Smith (1943), Bragg et al. (1950), Brown (1950), Conant and Hudson (1949), Jameson (1956), King (1932), McAlister ("1958" [1959]), Mayhew (1962; 1965), Ortenburger and Ortenburger (1926), Strecker (1908c), and Zweifel (1968).

• **NOMENCLATURE HISTORY.** Cope (1863) described *S. varius* and later (1866) reduced it to subspecific rank under *S. couchii*, but again accorded it specific status in 1875 as "*Scaphiopus varius*, Cope, subspecies *varius*." Boulenger (1882) treated *varius* as a synonym of *couchii* and Cope (1889) agreed with this disposition. *Scaphiopus rectifrenis* Cope (1863) was reduced to subspecific status under *S. varius* by Cope (1875), recognized as a distinct species by Boulenger (1882), and synonymized with *S. couchii* by Cope (1889). Smith and Sanders (1952) resurrected the name *rectifrenis* as a subspecific designation for western populations of *couchii*, and Langebartel and Smith (1954) and Fugler and Webb (1956) referred Mexican specimens to this race. But Zweifel (1956) suggested that the recognition of geographic races should await a detailed analytic study, and this course has been followed by subsequent authors. *Spea laticeps* Cope, 1893, was generally ignored in the literature until Chrapliwy and Malnate (1961) showed it to be a synonym of *S. couchii*.

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